

Optimizing Perimeter and Area**Example # 1:**

Your manager at the Independent Grocery store tells you that there is a transport truck out back that contains 2 meter sections of fencing. There are 100 sections total. The store wants you to create a rectangular section in the parking lot to hold their plants and soils for the spring. Complete the chart below to answer the questions.

Rectangle	Width (m)	Length (m)	Perimeter (m)	Area (m ²)
1	10	90	200	900
2	20	80	200	1600
3	30	70	200	2100
4	40	60	200	2400
5	50	50	200	2500
6	60	40	200	2400
7	70	30	200	2100
8	80	20	200	1600
9	90	10	200	900

- a) What is the maximum possible area for the garden plants and soils? 2500m²
- b) What dimensions give you this maximum area? 50m x 50m
- c) What shape provides an optimum area given a perimeter? Square
- d) How can the optimum dimensions be calculated from the given perimeter?

$$\text{Perimeter} \div 4$$

Example # 2:

A farmer wants to fence a rectangular animal pen with the minimum amount of fencing, so that the pen has an area of 64 square feet. Complete the chart below to answer the questions.

Rectangle	Width (ft)	Length (ft)	Perimeter (ft)	Area (ft ²)
1	1	64	130	64
2	2	32	68	64
3	3	21.3	48.6	64
4	4	16	40	64
5	5	12.8	35.6	64
6	6	10.6	33.3	64
7	7	9.14	32.3	64
8	8	8	32	64
9	9	7.1	32.2	64
10	10	6.4	32.8	64

- a) What is the minimum amount of fencing for the farmers pen? 32 ft
- b) What dimensions give you this minimum perimeter? 8ft x 8ft
- c) What shape provides an optimum perimeter for a given area? Square
- d) How can the optimum dimensions be calculated from the given area?

$$\sqrt{\text{Area}}$$